Missouri Asthma Burden Report

Missouri Asthma Prevention and Control Program

2002

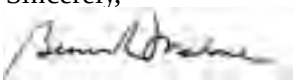
preface

The Missouri Department of Health and Senior Services is pleased to share the *2002 Asthma in Missouri Burden Report*. Asthma is a lung disease affecting more than 17.6 million Americans. The rate of asthma is on the rise, with children under 5 years old having the highest rate of increase. Our goal is to improve the health and quality of life of all Missourians with asthma.

Many different triggers can cause an asthma attack or make an attack worse. Without treatment and management, asthma can be life-threatening. In the year 2000, more than 80 Missourians died from asthma complications and thousands more required emergency medical treatment. In 2000, asthma was responsible for nearly 7,000 hospitalizations and over 30,000 emergency room visits in Missouri. Racial disparities were apparent in rates of hospitalization and emergency room visits among children and adults. Missed days of school and work can cause a significant loss of productivity, reduced quality of life, and economic hardships.

The Missouri Asthma Prevention and Control Program was established in 2001 to help raise asthma awareness within schools, worksites, communities, and health care providers statewide. We hope that this report will help its readers to better understand the burden of asthma in Missouri, how specific populations are affected, some proposed interventions, as well as current management techniques and treatments that are available.

Sincerely,



Bernard R. Malone, MPA, Director,
Division of Chronic Disease Prevention
and Health Promotion
Missouri Department of Health and Senior Services

table of contents

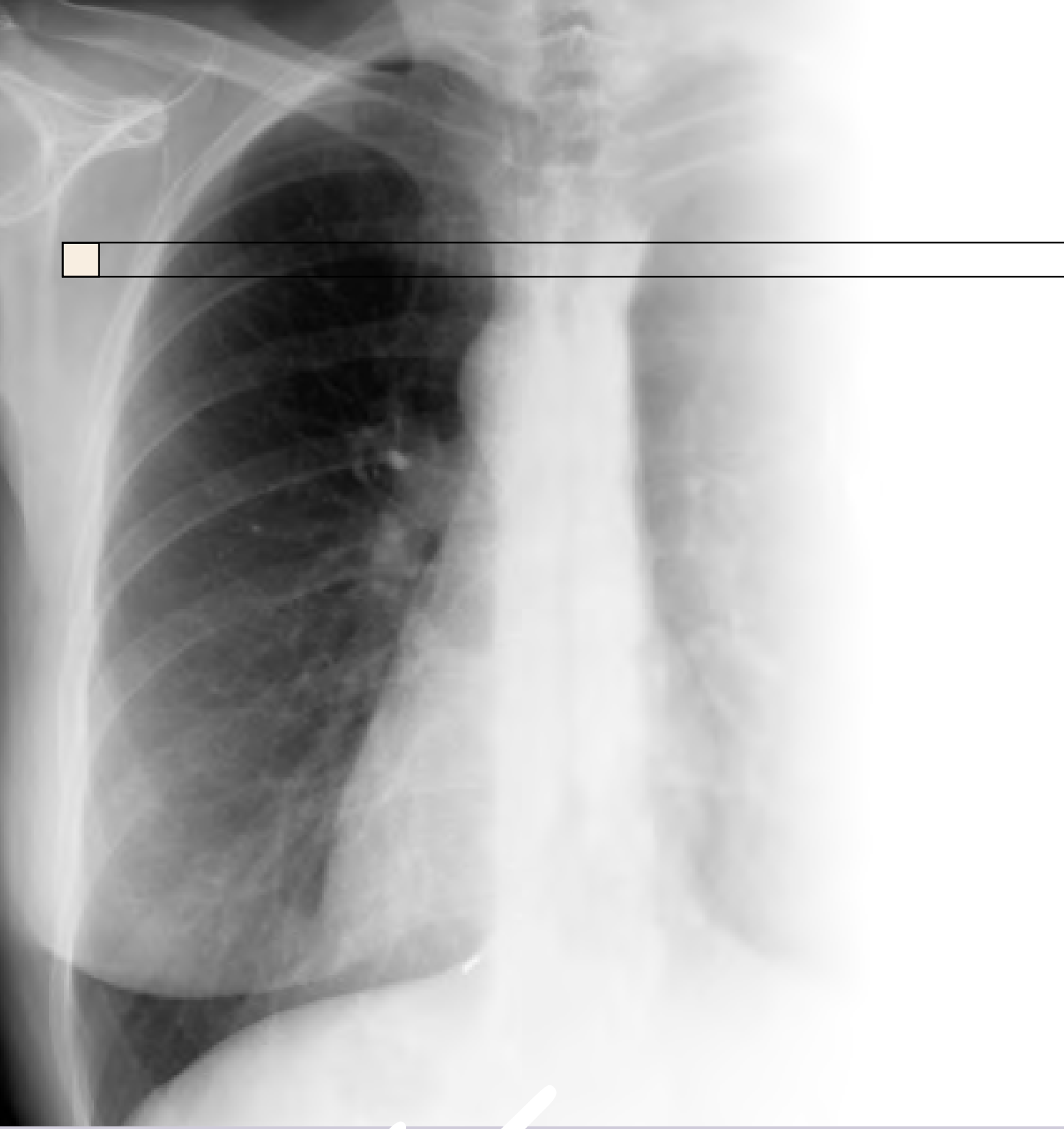
ACKNOWLEDGEMENTS

Authors:
James J. Brokaw, PhD, MPH
Nisreen H. Kabeer, MPH
Peggy Gaddy, RRT, MBA

Contributors:
Eduardo J. Simoes, MD, MPH, MSc
Anjali Deshpande, PhD, MPH
Michael Dietz, MS

Editing and Graphic Design:
Tisha Spencer, Firehouse Design
Heather Baer
Andrew Shea

To order a copy of this publication, please contact:
Missouri Department of Health and Senior Services
Bureau of Chronic Disease Control
920 Wildwood, P.O. Box 570
Jefferson City, MO 65102
1-800-316-0935



asthma

executive summary

Asthma is a chronic disease which can range from mild to life-threatening. For some individuals, asthma attacks can be triggered by many things, including allergens, respiratory infections, heavy exercise, exposure to chemicals, fumes, and smoke. Although there is no cure for asthma, the number of attacks and their severity can be reduced through medication and avoiding a known trigger.

Nationally, in 2000, approximately 14.6 million adults, or 7.5% of the adult population currently have asthma. The disease is more common among women (9.1%) than men (5.1%) and more African Americans have asthma (8.5%) than do whites (7.1%).[1] Children represent a particularly vulnerable population. An estimated 4.4 million American children have asthma. In Missouri, 7.3% (~300,000) of the adult population 18 years of age and older reported currently having asthma.

Asthma in the workplace and at school are also important issues. Asthma is one of the leading causes of students missing school, accounting for over 10 million missed days each year, nationally. Asthma can affect a person's quality of life and be very expensive for themselves and their family.

In 1998 in the U.S., asthma contributed to 13.9 million outpatient visits to health care providers, 2.0 million emergency room visits, and 423,000 overnight hospital stays.[2] The American Lung Association estimated that the total cost of asthma in 2000 was $12.7 billion, which included direct costs such as medical care and indirect costs such as lost productivity and missed school days.

Signs and Symptoms of Asthma

Common symptoms of asthma include shortness of breath, wheezing, tightness in the chest, and/or cough. Symptoms can develop slowly, or suddenly and unexpectedly, creating great distress. Difficulty breathing may be the most common reason patients seek urgent care.

Asthma is the number one cause of hospitalization among children under 15 years of age, and accounts for one-sixth of all pediatric emergency room visits in the United States.[4] Missouri data shows children under 15, particularly males and African Americans, have the highest rates of hospitalization and emergency room visits due to asthma.

Adults and children who are African American or other minorities have a greater chance of having asthma. They also have more hospitalizations, emergency room visits, and death because of their asthma. It is very important that these groups learn more about asthma, so they can control their disease and prevent asthma attacks.

Asthma attacks can be reduced by avoiding the indoor and outdoor triggers that cause attacks, having regular doctor visits, and the correct treatment for a person's asthma.

An important part of managing asthma in Missouri is educating people with asthma and their families about how to control their disease.

the missouri asthma prevention

The overall goal of the Missouri Asthma Prevention and Control Program (MAPCP) is to improve the capacity of Missouri's public health system to define and reduce the burden of asthma through effective linkages and comprehensive surveillance and evaluation.

The first efforts to address asthma in Missouri began with a statewide effort to collect data in 1998. At that time, little was known about the number of Missourians affected by asthma. The Behavioral Risk Factor Surveillance System (BRFSS), a telephone-based random digit-dial survey of various disease, conditions and risk factors, developed by the Centers for Disease Control and Prevention (CDC), addresses asthma in adults and among children living within the household. The asthma related questions developed by CDC continued to be included in the BRFSS for the years 1999, 2000, 2001 and 2002. The BRFSS and its questions are further described in the Data Sources section of this report.

The Missouri Department of Health and Senior Services (DHSS) has long recognized asthma as a major public health problem. In the fall of 2000, the Director of DHSS began the process of developing the Missouri Asthma Prevention and Control Program (MAPCP). Division directors within DHSS were asked to assess the problem of asthma in Missouri and make recommendations for a public health response to this increasingly common chronic disease.

As a first step in developing a comprehensive plan, a DHSS Asthma Workgroup was formed in April of 2001. The workgroup decided to develop a plan that included ways to reach the following goals:

- Reduce asthma-related deaths;
- Reduce asthma-related hospitalizations;
- Reduce asthma-related emergency room visits;
- Reduce the number of school days missed due to asthma;
- Increase the number of Missourians with asthma who receive appropriate medical care.

Leaders of the workgroup worked together in applying for a CDC planning grant in the summer of 2001. The grant was awarded in October of 2001. The objectives of the grant are to:

- Establish a framework to address asthma on a statewide basis;
- Establish/improve asthma surveillance;
- Establish a statewide advisory board;
- Develop an asthma state plan;
- Develop steps to carry out the state plan.

and control program

MAPCP staff were put in place in early 2002 and the first advisory board meeting was held on July 31, 2002. The purpose of the Missouri Asthma Prevention and Control Program Advisory Board (MAPCPAB) is to develop a statewide focus on asthma surveillance, prevention and control; provide advice regarding asthma-related issues; assist in the development of a state plan; and serve as an outside partner to gain support for the program and its services.

The state plan will serve as a guide to addressing the problems and concerns Missouri faces due to asthma. Measurable goals and objectives will be outlined in the state plan, as well as management and asthma prevention techniques. The amount of progress made statewide in the efforts to decrease asthma and to assist those who suffer from it will be determined by a continuing process and outcome evaluation. The MAPCPAB will assist in working together with statewide partners to address Missouri's asthma problem from a broader point of view.

asthma in missouri

The BRFSS 2000 data for Missouri adults, age 18 or older, provides the prevalence data (how often the disease occurs) on asthma in adults.

- More than 1 in 10 (445,840) Missouri adults, age 18 or older, have been diagnosed with asthma at some time in their life. (Table 1)
- Of these, approximately 300,000 or 7.3% of Missouri's adult population currently have the disease and should be under medical care. (Table 1)
- Nationally, Missouri ranks 22nd in lifetime asthma prevalence and 32nd for current asthma prevalence.

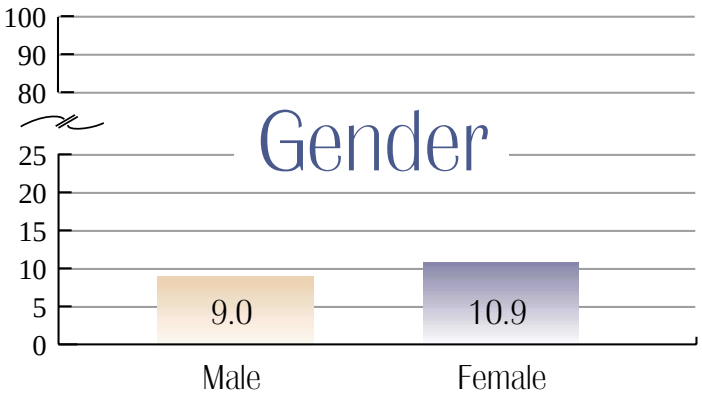
Table 1. Estimated Prevalence (%) of Adult Asthma, 2000

	STATES	LIFETIME ASTHMA
Highest	Maine	12.5
	Oregon	12.1
	Missouri	**10.6**
	United States	**10.5**
	Louisiana	8.0
Lowest	South Dakota	8.0

	STATES	CURRENT ASTHMA
Highest	Maine	9.0
	Oregon	8.8
	United States	**7.5**
	Missouri	**7.3**
	South Dakota	5.7
Lowest	Louisiana	5.2

For the purposes of this report, Missourians who reported ever being diagnosed with asthma were considered to have lifetime asthma, regardless of current disease status.

asthma in adults



Prevalence of Adult Asthma in Missouri, BRFSS 1998-2000

Figure 1
About 10% of adult Missourians reported ever having asthma. Although the disease affects both genders, asthma is slightly more common among women (10.9%) than men (9.0%).

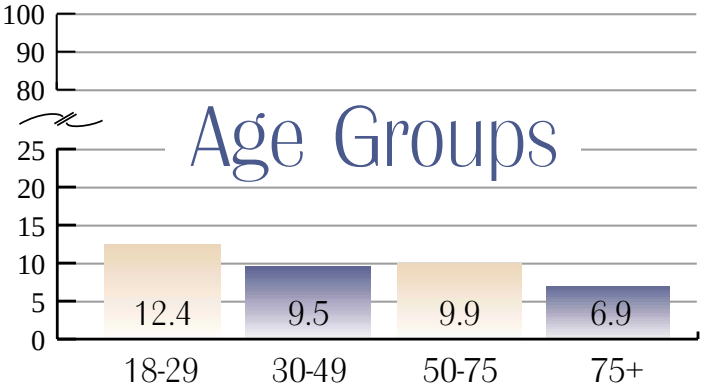


Figure 2
Unlike many chronic diseases, asthma afflicts young adults more than the old. Young adults aged 18-29 have the highest prevalence of asthma while the elderly 75 and older have the lowest.

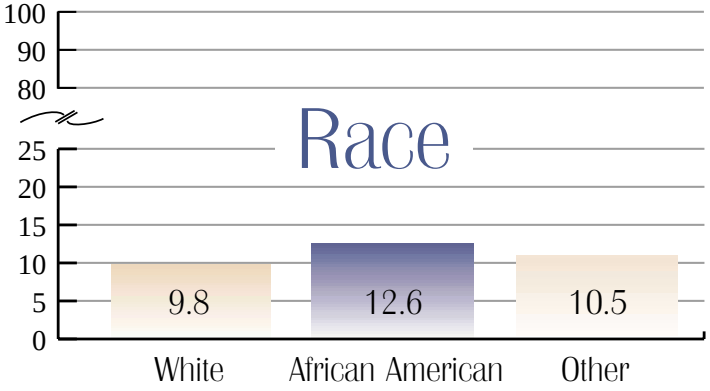


Figure 3
Racial differences exist with African Americans showing a higher occurrence of disease. The prevalence of asthma among African Americans is 12.6%, compared to 9.8% among whites and 10.5% among all other racial groups combined.

asthma in children

Asthma occurs three times more often in males than in females before puberty.[5] In children, asthma generally develops before the age of five, with the majority occurring under the age of three.

Although there is no system currently in place to completely measure the burden of asthma among children, the BRFSS provides information on households that have children who have been told by a healthcare professional that they have asthma.

An estimated 6.7% of Missouri adults live in households with at least one child who has asthma. The prevalence of childhood asthma was greater among the households of 30 to 49-year old survey participants than among those of other age groups. Approximately 7.2% of the adults in this age group reported living with one or more children with asthma, compared to older adults. This may be due in part to those aged 30-49 being more likely to have young children in their household.

The prevalence of childhood asthma was greater among the households of African-American survey participants than among those of other races (Figure 4). Nearly 1 in 10 African-American adults live with at least one child with asthma, while approximately 1 in 15 adults in other racial groups live with a child who has asthma.

Hospitalization, emergency room visits and death data for children are presented in the Morbidity and Mortality sections of this report.

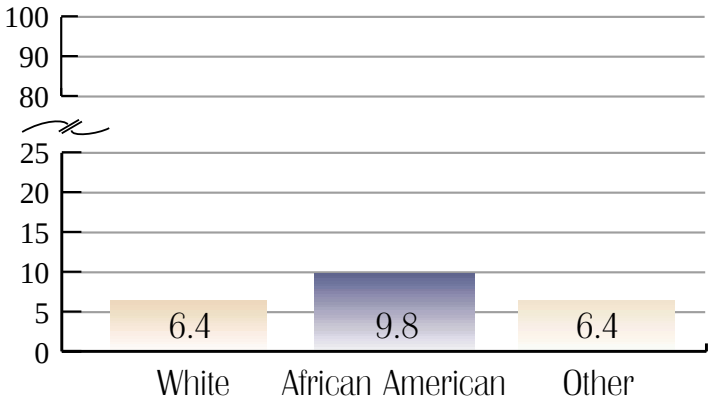


Figure 4
Prevalence of Households who have Children with Asthma in Missouri by Race of Survey Participant, 1998-2000

occupational asthma

Asthma is also common in the workplace. According to the United States Department of Health and Human Services (USDHHS), asthma is the leading work-related lung disease.[6] The overall national prevalence of occupational (work-related) asthma is unknown, but is estimated that between 2% and 15% of all adults have asthma.7 Recent research suggests that, in some regions, as much as 20% of adult onset asthma may be work-related.

Over 250 agents (chemicals and allergens) that can cause asthma have been found in the workplace.[6] Among those individuals reporting work-related asthma, clear links have been reported between the level of exposure to specific agents and severity of symptoms.

Certain jobs and industries in four selected states (California, Massachusetts, Michigan, and New Jersey) have been found to be high-risk for work-related asthma cases. Among industries, 41.5% of work-related asthma cases occurred in manufacturing industries. Manufacturing industries may range from chemical to textiles. The industry with the next highest percent of asthma cases was the service industry at 31.2%, with a majority of them occurring in the area of health services.

Some jobs that reported work-related asthma cases were operators, fabricators and laborers (32.3%), technical, sales and administrative (20.7%) and managerial and professional specialties (17.6%).

While many asthma attacks do not require a hospital visit, they can impair a person's quality of life, productivity, and economic stability. Currently, Missouri does not have a system in place to completely quantify or address the problem of occupational asthma.

asthma morbidity

(suffering from illness)

When someone has an asthma attack, they must receive the correct medical treatment to reverse the symptoms and restore normal breathing. If the attack is particularly severe, the person may seek urgent care in an emergency room. In some cases, hospitalization may be required. Although looking at the number of people who seek medical care is not the only way to determine asthma morbidity, it does provide useful information about asthma's impact on society.

During the period of 1993-1999, there were over 50,000 asthma hospitalizations in Missouri. The annual age-adjusted rate for this seven-year period was 14.1 cases per 10,000 residents per year.

- African Americans were hospitalized at a rate nearly five times that of whites.
- Other races were hospitalized at about twice the rate of whites.
- Females were hospitalized slightly more frequently than males.
- Overall, the trend lines suggest a gradual decrease in hospitalization rates, especially among African Americans and other races.

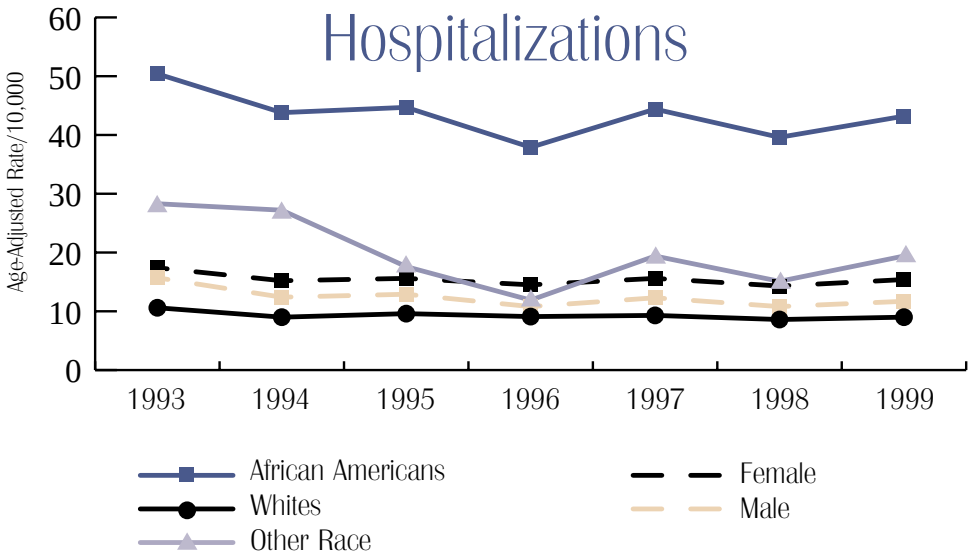
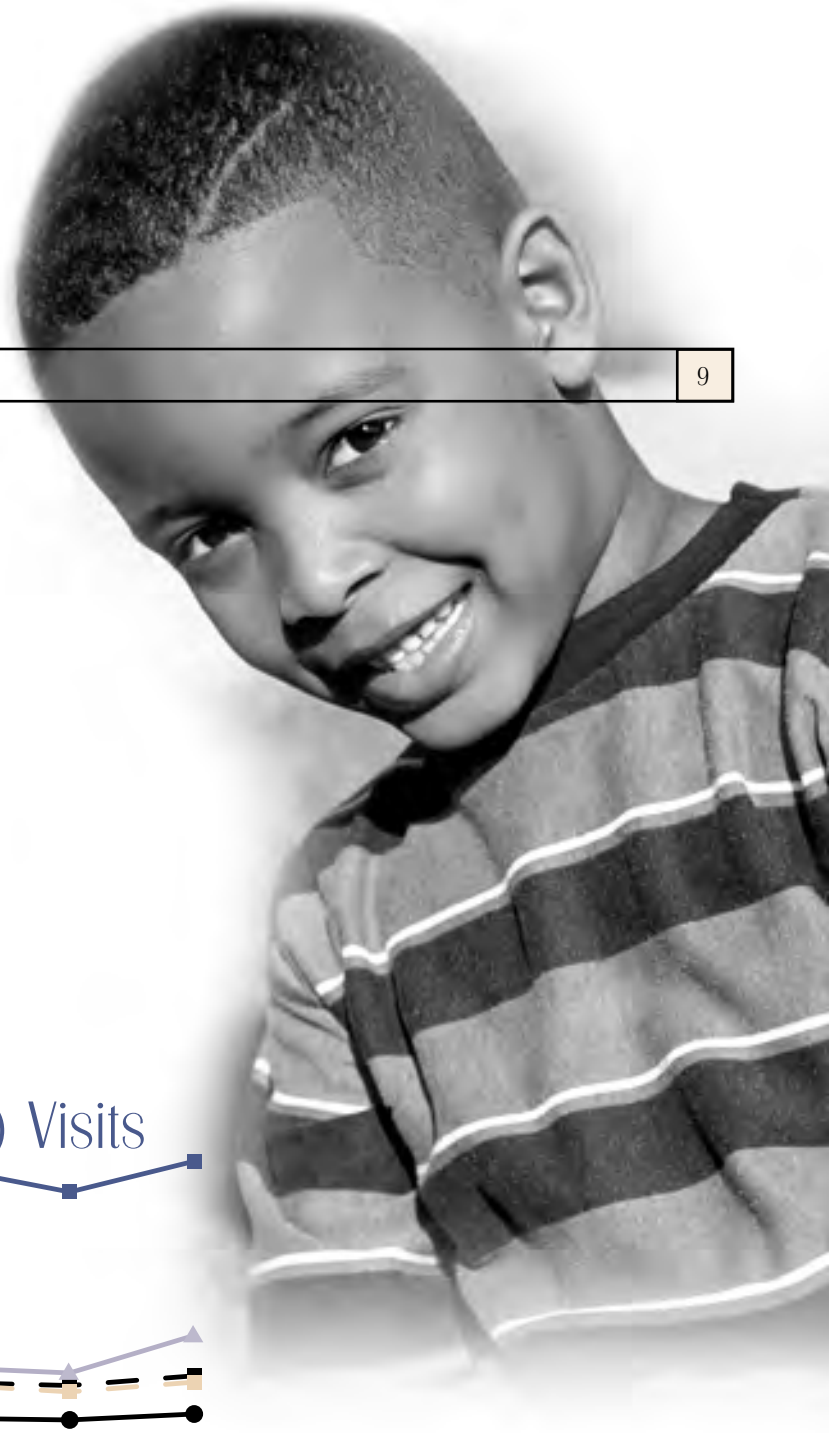


Figure 5
Trends in Rates of Inpatient Hospitalization, 1993-1999



From 1993 to 1999, Missourians made nearly 196,000 visits to the emergency room for asthma. The annual age-adjusted rate for this seven-year period was 58.7 cases per 10,000 residents per year.

- African Americans visited the ER at a rate of nearly 6 times that of whites.
- Other races visited the ER at about twice the rate of whites.
- Males and females visited the ER at roughly the same rates.
- Overall, the trend lines suggest a gradual increase in ER visit rates, especially among African Americans and other races.

This is consistent with national data. [3,8]

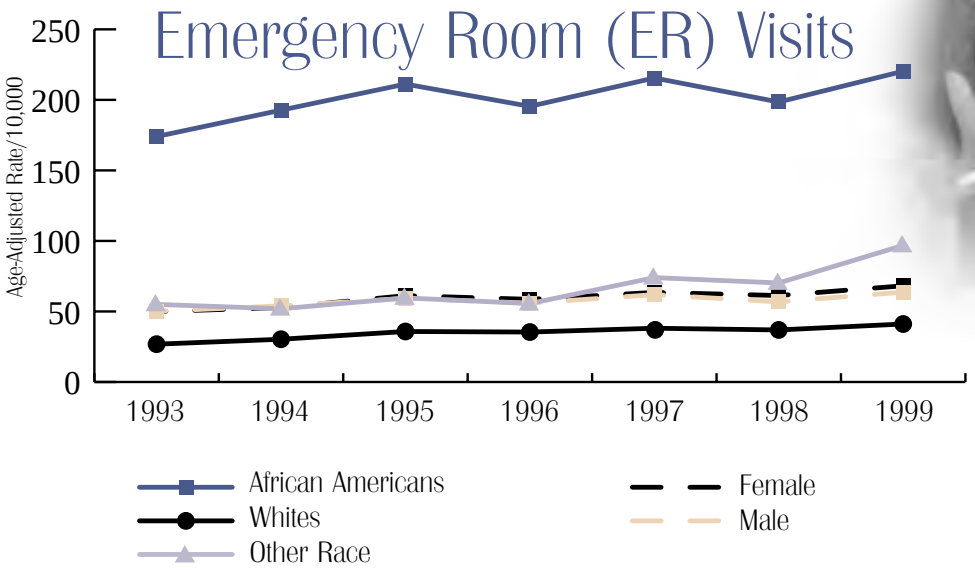
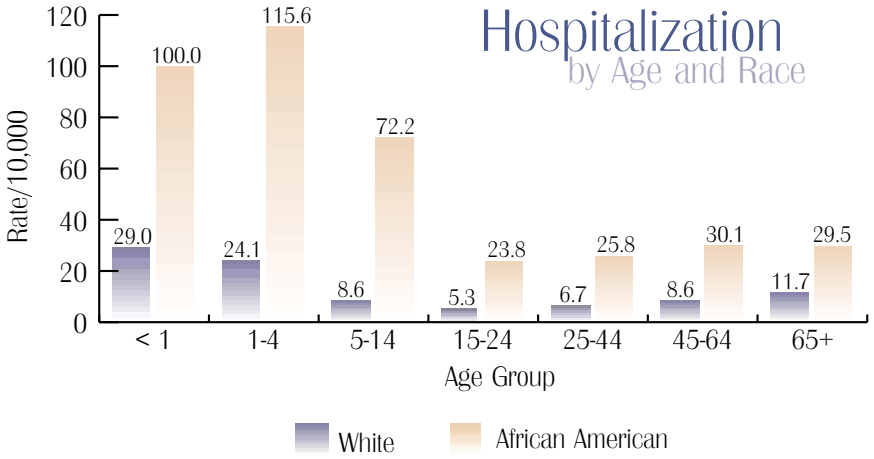


Figure 6
Trends in Rates of ER Visits, 1993-1999

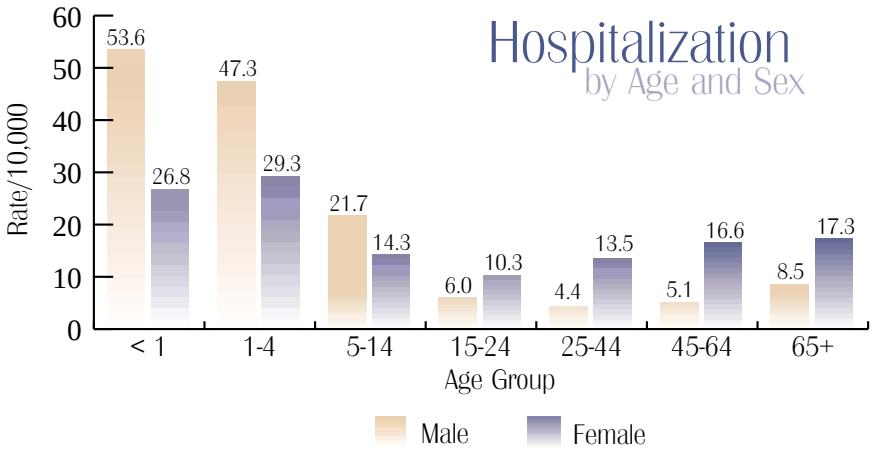
asthma morbidity

Figure 7
Rates of Asthma Inpatient Hospitalizations 1993-2000 by Age and Sex



- The asthma hospitalization rates for females were greater than the rates for males in age groups 15 years and above.
- Male children under 15 years of age were hospitalized at a higher rate than females of any age.
- The female hospitalization rate (15.3/10,000) was, on average, higher than the male rate (10.8/10,000).

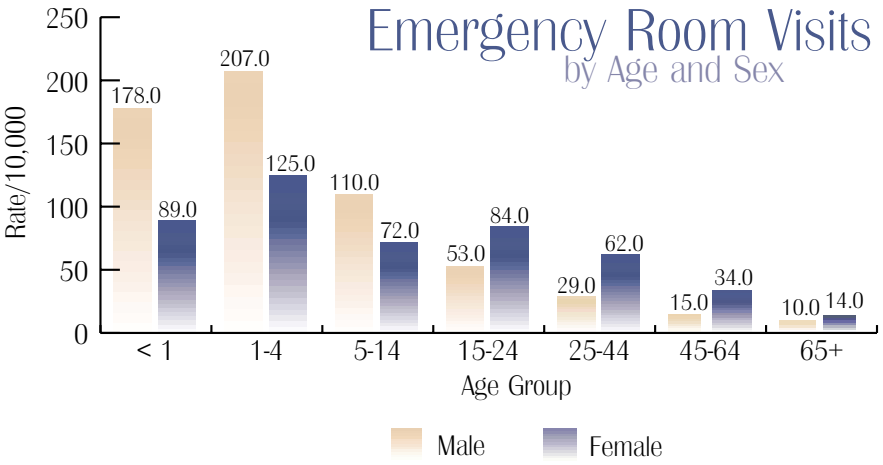
Figure 8
Rates of Asthma Inpatient Hospitalizations 1993-2000 by Age and Race



- The asthma hospitalization rates for African Americans were greater than the rates for whites across all age groups.
- This difference is particularly apparent in children under 15 years of age.

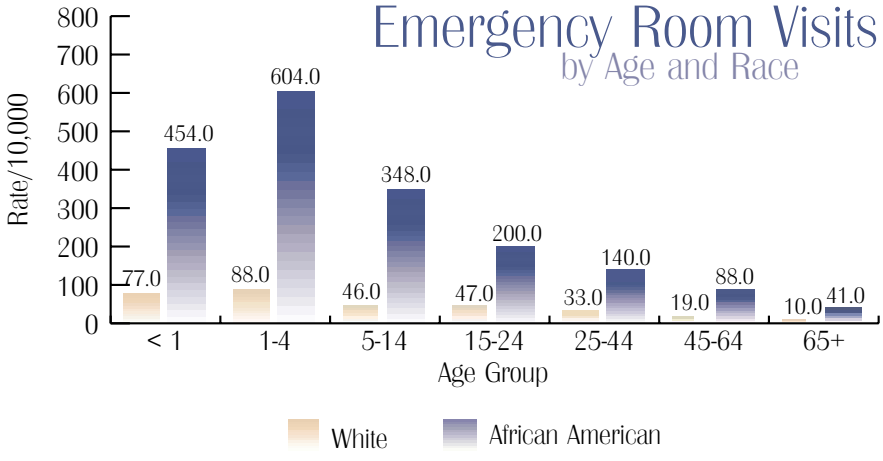
These findings are similar to the national statistics.[3,8]

Figure 9
Rates of Emergency Room visits 1993-2000, by Age and Sex



- The asthma ER visit rates for females exceeded the rates for males in age groups 15 years and above.
- Male children under 15 years of age received outpatient treatment at a higher rate than females of any age
- Asthma ER visit rates for both genders, on average, decreased as people got older.

Figure 10
Rates of Emergency Room visits 1993-2000, by Age and Race



- The asthma emergency room visit rates for African Americans was greater than the rates for whites across all age groups.
- African-American children under 15 were particularly affected.

asthma mortality

(deaths)

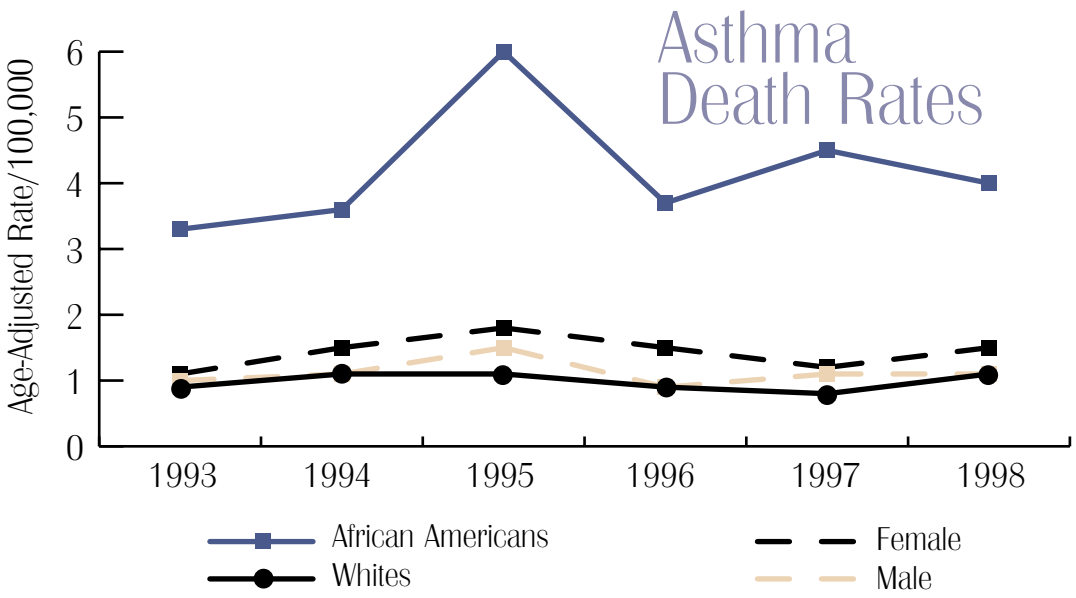


Figure 11
Trends in
Asthma Death
Rates 1993-1998

National

From 1980 to 1995, the asthma mortality (death) rate increased by over 50%, with the greatest increase occurring among children and young adults. African Americans, women, and the elderly have the highest rates of asthma deaths.[3,8]

Missouri

During the period 1993-1998, there were nearly 600 asthma deaths in Missouri. The annual age-adjusted mortality rate for this six-year period was 1.3 deaths per 100,000 residents.

- The trend lines suggest that asthma death rates have not changed significantly during this time, despite some fluctuation (Figure 11).
- However, on average, the death rate due to asthma for African Americans was four times that of whites.
- The death rate for females was about 25% greater than the rate for males.

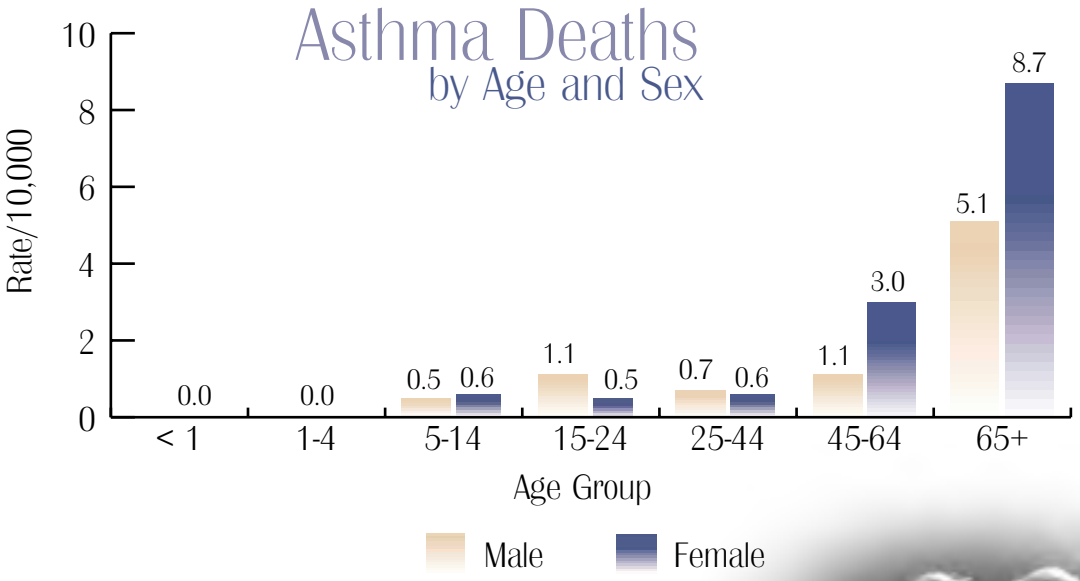


Figure 12
Rates of Asthma Deaths 1993-1998, by Age and Sex

- The death rate due to asthma increased as people got older (Figure 12).
- The death rate for females was greater than the rate for males in the 45-64 and 65+ age groups, but not in the younger age groups.
- Among both males and females, the asthma death rate for African Americans was greater than the rate for whites across all age groups (Figures not shown). The death rate due to asthma was highest among elderly African Americans.

asthma prevention & control

PREVENTION

Lack of treatment and inappropriate therapy are major contributors to asthma morbidity and mortality. Many effective disease management strategies have been found by experts in the field of asthma care; these strategies will help patients manage their asthma and can help reduce the chances of hospitalizations and emergency room visits.[9]

Educating doctors and other health care workers about effective asthma care is therefore important to reducing the problem of asthma in Missouri. Not only should the doctor be educated on best practices for asthma management, but the patient should also be educated to participate in all areas of their treatment. It is very important to have a strong patient-doctor relationship. Patients should work with their doctor to develop a written daily self-management plan and an emergency action plan in case of a major asthma attack.

The section to the right outlines the recommended strategies for asthma management based on the Guidelines for the Diagnosis and Management of Asthma.[9]

Diagnose asthma and form a partnership with patient.

Diagnose asthma by creating:
- A history of continuing symptoms;
- Reversible airflow obstruction using spirometry; and
- Rule out other possible diseases.

Create patient-doctor relationship:
- Address patient's concerns;
- Agree on the goals of asthma therapy;
- Agree upon a written action plan for patient self-management.

Reduce swelling, symptoms, and attacks.

Prescribe anti-inflammatory drugs to patients with mild, moderate, or severe continuing asthma.

Reduce exposures to triggers of asthma symptoms:
- Estimate patient's exposure and sensitivity to allergens;
- Give written and verbal instructions on how to avoid or reduce factors that make the patient's asthma worse.

Monitor and manage asthma over time.

Train all patients to monitor their asthma:
- All patients should monitor symptoms;
- Patients with moderate-to-severe, asthma should also monitor their peak flow.

See patients at least every 1 to 6 months:
- Measure (attainment) of goals of asthma therapy and patient's concerns;
- Adjust treatment, if needed;
- Review the action plan with patient; and
- Check patient's inhaler and peak flow technique.

Treat asthma attacks immediately.

Prompt use of short-acting inhaled beta$_2$-agonists and, if attack is moderate to severe, a 3- to 10-day course of oral steroids;
Prompt communication and follow-up with a health care provider.

interventions

In 2000, leading experts were brought together to agree on best practices to create a unified, community-based approach to asthma prevention and management.[10] A unified approach, using all of the infrastructure of a community, including schools, public health departments, community outreach programs, and healthcare workers, would let a comprehensive community-based program put effective asthma interventions into practice. Below is a list of key steps that can reduce illness and death from asthma.[10]

Patient Care Management

This component refers to the clinical care of asthma patients using the best-practice Guidelines listed in Table 3.

- Identify patients with asthma;
- Link every patient with asthma to appropriate care;
- Measure the outcomes of care.

Community-Based Intervention

The goal of this component is to form partnerships and work with high-risk, culturally diverse populations.

- Promote equality for people with asthma;
- Make important and useful information for asthma patients available;
- Improve indoor air quality and the outdoor environment;
- Assure access to quality medical care.

School-Based Education/Intervention

The focus is on the management of childhood asthma through linkages with the school system, health care providers, community agencies, and parents.

- Give appropriate school health services and asthma education programs;
- Offer a healthy and smoke-free school environment;
- Offer students with asthma appropriate physical education or physical activity opportunities on a daily basis;
- Use a coordinated community approach to plan and implement school-based asthma programs.

Indoor Air Quality

Because allergens, cigarette smoke and other irritants in the air have a direct impact on people with asthma, it is necessary to improve air quality at school, at work and at home.

- Put into practice, policies and regulations related to indoor air quality at all site locations;
- Give on-site environmental tests and corrective measures to reduce exposure;
- Add indoor air quality into every asthma medical intervention and all community coalition efforts;
- Develop and organize a community awareness and education plan for targeted and high-risk populations.

data sources

The Missouri Department of Health and Senior Services gathers information on asthma from a number of sources on an on-going basis to constantly monitor the burden of asthma in Missouri. This data will be used for planning and evaluation of activities conducted through the Missouri Asthma Prevention and Control Program.

Behavioral Risk Factor Surveillance System (BRFSS)

BRFSS is a random telephone survey that is conducted every year of adults 18 years or older. It was developed by CDC in 1986 and is currently conducted in all 50 states. The BRFSS collects information on the health status and lifestyle of Missouri residents to monitor and identify the factors that increase a person's risk of disease. Data are weighted to reflect the state's adult population.

Standard questions regarding asthma were first asked in 1998 and continue to be asked to the present date. Participants who answered "yes" to "Has a doctor, nurse, or other health professional ever told you that you have asthma?" were considered to have lifetime asthma. Those who responded "yes" to "Do you still have asthma?" were considered to currently have asthma.

Although the Missouri BRFSS was not designed to directly estimate the prevalence of asthma among children, it did include a question intended to reveal the magnitude of childhood asthma among Missouri households. Thus, children under 18 years of age were considered to have asthma if the adult respondent answered "yes' to "Has a doctor, nurse, or other health professional ever said that [the child/any of the children] living in your household [has/have] asthma?"

Missouri Information for Community Assessment (MICA)

The Missouri Center for Health Information Management and Evaluation collects and manages data on several health care indicators for all Missouri residents. Inpatient hospitalizations rates, ER visit rates and mortality data were obtained from Missouri Information for Community Assessment (MICA).

Trends in asthma hospitalizations and emergency room visits in Missouri for the period 1993-2000 were derived from patient discharge records that list asthma as the primary diagnosis (International Classification of Diseases, 9th Revision, code 493).

Asthma mortality in Missouri for the period 1993-1998 was based on death certificate data with asthma as the underlying cause of death (ICD-9 code 493). This data is from Missouri Vital Statistics.

resources

References

1. CDC. Self-reported asthma prevalence among adults—United States, 2000. MMWR 2001;50:682-686.
2. National Center for Health Statistics. New asthma estimates: tracking prevalence, health care, and mortality. www.cdc.gov/nchs/products/pubs/pubd/hestats/asthma/asthma.htm, 2001.
3. American Lung Association. Trends in asthma morbidity and mortality. www.lungusa.org/data/, 2002.
4. American Lung Association. Asthma in children fact sheet. www.lungusa.org/asthma/ascpedfac99.html, 2001.
5. Sharma, G. Asthma. eMedicine Journal 2002;3(1):1-24. (http://www.emedicine.com/ped/topic152.htm) August 21, 2002.
6. U.S. Department of Health and Human Services. Worker Health Chartbook, 2000. Public Health Service, Centers for Disease Control and Prevention. National Institute for Occupational Safety and Health, 2000.
7. Brownson RC, Remington RL, Davis JR. Chronic Disease Epidemiology and Control, second edition. Washington, D.C.: American Public Health Association, 1998.
8. Mannino DM, Homa DM, Akinbami LJ, Moorman JE, Gwynn C, Redd SC. Surveillance for asthma—United States, 1980-1999. MMWR 2002;51 (SS-1):1-13.
9. National Heart, Lung, and Blood Institute, National Asthma Education and Prevention Program. Expert Panel Report 2: Guidelines for the Diagnosis and Management of Asthma. Bethesda, MD: NIH pub no 97-4051; 1997.
10. Kaiser Permanente/American Lung Association. Asthma prevention, management and treatment: community-based approaches for the new millennium. www.lungusa.org/asthma/report01, 2000.

Links

St. Louis Asthma Consortium
www.asthma-stlouis.org

Asthma and Allergy Foundation of America
www.aafa.org

American Lung Association
www.lungusa.org

National Heart Lung and Blood Institute (NHLBI)
http://www.nhlbi.nih.gov/health/public/lung/index.htm

NHLBI Asthma Guidelines
http://www.nhlbi.nih.gov/guidelines/asthma/asthgdln.htm

National Asthma Education and Prevention Program
http://www.nhlbi.nih.gov/about/naepp/index.htm

Centers for Disease Control and Prevention
http://www.cdc.gov/nceh/divisions/ehhe.htm

City of St. Louis Department of Health
http://stlouis.missouri.org/citygov/health

Kansas City Department of Health
www.kcmo.org/health.nsf/web/home?opendocument

Missouri Department of Natural Resources-Air Quality
http://www.dnr.state.mo.us/alpd/esp/esp_aqm.htm

National Institute for Occupational Safety and Health
http://www.cdc.gov/niosh/asthmapg.html

Asthma and Allergy Network-Mothers of Asthmatics
http://www.aanma.org/

National Jewish Medical and Research Center
http://www.njc.org/diseases/dt4.html

Environmental Protection Agency
www.epa.gov/iaq

American Academy of Allergy, Asthma, and Immunology
www.aaaai.org

American Academy of Pediatrics
http://www.aap.org/

This publication was supported by Grant/Cooperative Agreement Number U59/CCU720866-01 from the Centers for Disease Control and Prevention.

Alternate forms of this publication for persons with disabilities may be obtained by contacting the Missouri Department of Health and Senior Services, Division of Chronic Disease Prevention and Health Promotion, PO Box 570, Jefferson City, MO 65102-0570, (573) 522-2861.

Hearing impaired citizens telephone 1-800-735-2966. EEO/AAP Services provided on a non-discriminatory basis.